REMARKS

Claims 25-48 were examined in the Office Action mailed August 7, 2007, while claims 49-56 stand withdrawn pursuant to Election/Restriction Requirement. The Applicants note with appreciation the continued indication that claim 47 recites patentable subject matter. For the reasons discussed below, the Applicants continue to believes claim 47 depends from an allowable independent claim, and respectfully declines the invitation to amend claim 47 into independent form at this time.

The following rejections under 35 U.S.C. § 103(a) are currently pending:

- Claims 25, 27-29, 34, 36-44 and 48 as unpatentable over German Patent Publication No. DE 36 00 813 A1 ("Hundhausen") in view of U.S. Patent No. 6,303,891 to Gault ("Gault").
- Claims 26 and 45 as unpatentable over Hundhausen and Gault, further in view of U.S. Patent No. 5,124,527 to Takano ("Takano").
- Claim 30 as unpatentable over Hundhausen and Gault, further in view of U.S. Patent No. 5,558,791 to Fawer ("Fawer").
- Claims 31-33 as unpatentable over Hundhausen and Gault, further in view of U.S. Patent No. 4,463,243 to Church ("Church").
- Claim 35 as unpatentable over Hundhausen and Gault, further in view of U.S. Patent No. 4,645,903 to DeVito, et al. ("DeVito").
- Claim 46 as unpatentable over Hundhausen and Gault, further in view of U.S. Patent No. 3,778,891 to Bishel ("Bishel").

In the Office Action mailed April 9, 2007, the Hundhausen reference was cited as teaching welding of ductile cast iron to a steel component, the Gault reference was cited as teaching use of a "universal" shielding gas for welding carbon and stainless steels, and it was asserted that it would have been obvious to use the Gault "universal" gas with the Hundhausen arc welding process to

obtain the ductile cast iron welding method of claim 25. April 9, 2007 Office Action at 4-6. In the Amendment filed July 9, 2007, the Applicants noted the well-known, and heretofore resolved, difficulties in welding high-carbon ductile cast iron to materials such as steels, and identified the lack of any suggestion or motivation to use a gas for steel welding in a ductile cast iron welding process.

1. Gault Does Not Teach Welding of High Carbon Content Iron. In response to the Applicants' remarks, in the pending Final Office Action it is maintained that Hundhausen teaches that welding of cast iron to steel, and Gault teaches the claimed gas mixtures "for welding of both carbon steels ... and stainless steels." August 7, 2007 Final Office Action at 10-11 (emphasis in original). It is then noted that "both references have common teachings of high iron and carbon content ..." *Id.* at 11. The implication is that Gault teaches welding of materials such as those in Hundhausen, and thus it is reasonable to presume Gault's gas would be suitable for use in Hundhausen's welding process.

The Applicants respectfully maintain that Gault does *not* teach or suggest anything regarding welding of high carbon content iron, such as ductile cast iron.

As the Examiner correct notes, Gault discloses welding of *steels* – both standard carbon steel and stainless steel. As is universally known in the art, carbon *steels* have very low carbon content (typically ~0.1%-0.2% carbon), similar to stainless steels – levels that are at least an order of magnitude lower than the typical ~3.5% carbon in ductile cast iron. Such steels simply do not have cast iron's severe carbon precipitation problems in weld zones, and thus there would be no reason to expect the use of any particular steel welding gas would produce

satisfactory results when applied to ductile cast iron welding (and certainly, nothing in Gault even hints at such an application of its shielding gas). Accordingly, the Applicants respectfully request reconsideration of the unsupportable assertion that Gault teaches welding of high iron and carbon content, and withdrawal of the assertion that it would have been obvious to use Gault's gas with Hundhausen's welding process.

2. The Unobviousness of the Present Invention. In the July 9, 2007 remarks, the Applicants discussed the lack of suggestion or motivation to use the recited process gas to provide satisfactory welding of ductile cast iron – a lack of obviousness which, the Applicants submit, is all the more stark in view of the long-known problems with welding ductile cast iron in high-volume production environments, and the fact that despite the tremendous motivation to find an improved welding process, no one in the last several decades has made the assertedly obvious combination in order to provide the improved ductile cast iron welding process recited in pending claim 25.

The pending Final Office Action asserts that Gault's "universal" welding gas "for welding carbon steels and stainless steels ... [is] advantageous for providing optimum welding conditions that will not alter the carbon content of the weld metal chemistry." August 9, 2007 Final Office Action at 11. As noted above, at most Gault teaches that in *low carbon steels* (*i.e.*, carbon steels and stainless steels), satisfactory welds made be obtained – a fact perfectly consistent with the knowledge in the art that the low concentration of carbon in low carbon steels does not significantly migrate and result in fundamental alloy strength

changes during welding (unlike the well-known precipitation and localized strength reduction associated with cast iron). Thus, whatever, Gault teaches with regard to welding of low-carbon steels, *Gault does not teach or suggest that its gas mixture would be "advantageous for providing optimum welding conditions" for ductile cast iron welding.*

Finally, with respect to the last portion of the Examiner's Response to Arguments regarding the Applicants' having not provided an affidavit/ declaration to show advantageous features and/or unexpected results, the Applicants have attached hereto a Declaration prepared by one of the present inventors, Jorma Tani. This Declaration builds on the description of the state of the art already of record in the original Specification, discussing both the development of the inventive ductile cast iron welding process using of the recited gas mixtures in high production rate welding, and – as an important independent confirmation of the significance of this advance – the prestigious peer recognition given the inventors for finally solving this very difficult and long-standing welding process problem. Specifically, the attachments to the declaration include: (i) a copy of a technical paper describing the process development and results which was presented at an American Foundry Society Congress (the Society being one of the principle casting and welding technical societies in the world); and (ii) a copy of a letter from the American Foundry Society announcing that the inventors' technical paper had been selected as the recipient of an award, granted only once every four years, as "*having the greatest long range technical significance to the cast metals industry.*" This peer

recognition confirms that the Applicants' development of a solution to the difficult problem of welding ductile cast iron was not an obvious matter of applying low-carbon steel gases to a ductile cast iron welding environment, but instead was a true advance of the state of the art – an advance worthy of accolade by those of skill in the art.

In view of the foregoing, the Applicants respectfully submit that the present invention was not an obvious development in the art, and more specifically, it would not have been obvious to combine Gault's low-carbon steel welding gas with Hundhausen's high-carbon cast iron process, nor would there have been a reasonable expectation of obtaining satisfactory ductile cast iron welds using the Gault gas (none of the references providing any reason for one of ordinary skill to believe such a gas would address the notoriously difficult cast iron welding application). Accordingly, the Applicants respectfully request reconsideration and withdrawal of the § 103(a) rejections based on the combination of Hundhausen and Gault.

CONCLUSION

In view of the foregoing, the Applicants submit that claims 25-48 are in condition for allowance. Early and favorable consideration, and issuance of a Notice of Allowance for these claims is respectfully requested.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #038724.56337US).

Respectfully submitted,

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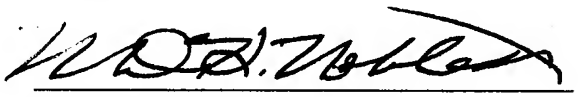

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